

WHAT IS CLAIMED IS:

1. A polymerizable composition comprising a mixture of an optically clear dead polymer, a reactive plasticizer in an amount to render the composition semi-solid and malleable, and, 5 optionally, an initiator, the dead polymer and reactive plasticizer exhibiting compatibility at temperatures not higher than 100°C, and wherein the polymerizable composition is semi-solid and malleable and, when polymerized, remains optically clear and exhibits low shrinkage.

10. A polymerizable composition comprising a mixture of i) a dead polymer derived from monomers that cannot be polymerized in less than 10 minutes in a mold under UV exposure, ii) a reactive plasticizer in an amount to render the composition semi-solid and malleable, the reactive plasticizer having a refractive index that closely matches the refractive index of the dead polymer and being capable of forming a crosslinked network when polymerized, and iii) optionally, an initiator, the dead polymer and reactive plasticizer exhibiting compatibility at temperatures not higher than 100°C; wherein the polymerizable composition is capable of polymerizing in less than 15 10 minutes in a mold under UV exposure, and wherein when polymerized the polymerizable composition exhibits an optical clarity of at least 85% at 2 mm thickness, a refractive index of at least 1.5, a glass transition temperature of at least 80°C, a modulus of elasticity greater than 10⁹ dynes/cm², a Shore D hardness greater than 80, and an Abbe number greater than 25.

20. 3. A polymerizable composition according to claim 2 which is impact-resistant upon polymerization.

25. 4. A polymerizable composition according to claim 2 which exhibits high fidelity replication upon polymerization.

30. 5. A polymerizable composition according to claim 2 which exhibits dimensional stability upon polymerization.

6. A polymerizable composition according to claim 2 wherein the reactive plasticizer is less than about 50% by weight of the composition.

35. 7. A polymerizable composition according to claim 2 wherein the reactive plasticizer is less than about 25% by weight of the composition.

8. A polymerizable composition according to claim 2 wherein the optically clear dead polymer is selected from the group consisting of polystyrenes, polysulfones, polyacrylates, polymethacrylates, polycarbonates, polyolefins, polyurethanes, copolymers and block copolymers.

5 9. A polymerizable composition according to claim 2 wherein the reactive plasticizer comprises reactive functional groups selected from the group consisting of acrylate, methacrylate, acrylic anhydride, acrylamide, vinyl, vinyl ether, vinyl ester, vinyl halide, vinyl silane, vinyl siloxane, (meth)acrylated silicones, vinyl heterocycles, diene, allyl, epoxies (with hardeners), and urethanes.

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